UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,716	01/26/2006	Richard Sharp	MSQ01-005-US	9797

43320 7590 11/05/2009

EVAN LAW GROUP LLC
600 WEST JACKSON BLVD., SUITE 625
CHICAGO, IL 60661

EXAMINER	
GANGLE, BRIAN J	
ART UNIT	PAPER NUMBER
1645	
MAIL DATE	DELIVERY MODE
11/05/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,716	SHARP ET AL.	
	Examiner	Art Unit	
	Brian J. Gangle	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *51-84,91,92,96-99 and 104-106* is/are pending in the application.

4a) Of the above claim(s) *53,54,57,58,61,63,65-84,92,98,99 and 104* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *51,52,55,56,59,60,62,64,91,96,97,105 and 106* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's amendment and remarks filed on 7/17/2009 are acknowledged. Claims 51 and 65 are amended. Claims 85-60, 93-95, and 100-103 are cancelled. New claims 105 and 106 are added. Claims 51-84, 91-92, 96-99, and 104-106 are pending. Claims 53-54, 57-58, 61, 63, 65-84, 92, 98-99, and 104 are withdrawn as being drawn to nonelected inventions. Claims 51-52, 55-56, 59-60, 62, 64, 91, 96-97, and 105-106 are currently under examination.

Objections Maintained

The objection to the specification for the use of the trademarks ROBBINS and APPLIKON is maintained for the reasons set forth in the previous office action.

Applicant has not addressed this objection.

The trademarks ROBBINS and APPLIKON have been noted in this application. ROBBINS appears on pages 4, 6, and 21 and APPLIKON appears on page 21. They should be capitalized wherever they appear and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

It is noted that the cited occurrences of improper use are only exemplary and applicant should review the specification to correct any other use of trademarks.

Claim Objections Withdrawn

The objection to claim 51 because the genus name, *Pseudomonas*, should be italicized, is withdrawn in light of applicant's amendment thereto.

New Claim Objections

Applicant is advised that should claim 64 be found allowable, claim 105 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claims 59-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections Withdrawn

The rejection of claims 59 and 60 under 35 U.S.C.§ 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention (biological deposit rejection), is withdrawn in light of applicant's arguments.

Claim Rejections Maintained

35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The rejection of claims 51-52, 55, 91, and 96-97 under 35 U.S.C. 102(b) as being anticipated by Hughes *et al.* (Bioline, pp 325-331, 2001; IDS filed 1/26/2006) is maintained for the reasons set forth in the previous office action.

Applicant argues:

1. That Hughes sets forth the therapeutic goal of treating *P. aeruginosa* infections by the application of phage carrying and encoding hydrolytic enzymes to destroy alginate biofilms and the eradication of *P. aeruginosa* infection, but does not describe or identify a phage carrying and encoding hydrolytic enzymes. Applicant asserts that, because Hughes does not describe or identify such a phage and merely sets forth the desirability to obtain such a phage, the reference is nothing more than an invitation to further experimentation. Applicant then argues that an invitation to investigate is not an inherent disclosure, referring to MPEP 2112 and *Metabolite v. Lab. Corp.*

Applicant's arguments have been fully considered and deemed non-persuasive.

Applicant's assertions regarding inherency and *Metabolite v. Lab. Corp.* are off-point. In *Metabolite v. Lab. Corp.*, the court was discussing whether a disclosure of a genus inherently disclosed all of the species within that genus. This is not even remotely related to the instant case, where all of the limitations of the claimed invention are specifically disclosed by the prior art reference. The disclosure of Hughes is prophetic; however, a prophetic disclosure is still a disclosure. According to the court in *In re Donohue* 226 USPQ 619 (Fed Cir 1985), It is well settled that prior art under 35 U.S.C. § 102(b) must sufficiently describe the claimed invention to have placed the public in possession of it. *In re Sasse,* 629 F.2d 675, 681, 207 USPQ 107, 111 (CCPA 1980); *In re Samour,* 571 F.2d at 562, 197 USPQ at 4; *see also Reading & Bates Construction Co. v. Baker Energy Resources Corp.,* 748 F.2d 64, 651-52, 223 USPQ 1168, 1173 (Fed.Cir. 1984). Such possession is effected if one of ordinary skill in the art could have combined the publication's description of the invention with his own knowledge to make the claimed invention. *See In re LeGrice,* 301 F.2d at 939, 133 USPQ at 373-74. It is not, however, necessary that an invention disclosed in a publication shall have actually been made in order to satisfy the enablement requirement. Therefore, the only question is whether the prior art reference was enabled. As shown by the instant specification, only basic molecular biology techniques (that were known and commonly used well before the instant filing date) were required to insert a heterologous gene into a phage.

As outlined previously, the instant claims are drawn to compositions for treating a bacterial biofilm wherein the biofilm is a biofilm of a patient, said composition comprising a bacteriophage that is capable of infecting a *Pseudomonas* bacterium, a polysaccharide lyase enzyme that is capable of degrading a polysaccharide within said biofilm, and a pharmaceutically acceptable antimicrobial agent.

Hughes *et al.* teach that application of phage carrying and encoding hydrolytic enzymes to destroy alginate biofilm (alginate lyase) offers huge therapeutic benefits and that delivery of phage in combination with other agents designed to reduce the severity of the symptoms of cystic fibrosis and bacterial colonization (such as antibiotics, DNAase or polypeptide defensins) could be used to effectively destroy lung biofilms (see page 329, paragraphs 2-3).

35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 51-52, 55-56, 91, 96-97, and newly submitted claim 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes *et al.* (Bioline, pp 325-331, 2001; IDS filed 1/26/2006) in view of Wilde *et al.* (WO 89/11291A1, 1989, IDS filed 5/23/2007) for the reasons set forth in the previous office action in the rejection of claims 51-52, 55-56, 91, and 96-97.

Applicant argues: that Wilde does not cure the deficiency of Hughes.

Applicant's arguments have been fully considered and deemed non-persuasive.

As set forth above, there is no deficiency in the rejection over Hughes.

As outlined above, the instant claims are drawn to compositions for treating a bacterial biofilm wherein the biofilm is a biofilm of a patient, said composition comprising a bacteriophage that is capable of infecting a *Pseudomonas* bacterium, a polysaccharide lyase enzyme that is capable of degrading a polysaccharide within said biofilm, and a pharmaceutically acceptable antimicrobial agent.

Hughes *et al.* teach that application of phage carrying and encoding hydrolytic enzymes to destroy alginate biofilm (alginate lyase) offers huge therapeutic benefits and that delivery of phage in combination with other agents designed to reduce the severity of the symptoms of cystic fibrosis and bacterial colonization (such as antibiotics, DNAase or polypeptide defensins) could be used to effectively destroy lung biofilms (see page 329, paragraphs 2-3).

Hughes *et al.* do not teach that the antimicrobial agent should be encoded by the bacteriophage and do not specifically state that the agent is active against *Pseudomonas*.

Wilde *et al.* disclose an antimicrobial polypeptide, the sequence of said polypeptide, and expression vectors encoding said polypeptide (see abstract and page 7).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to use the bacteriophage of Hughes *et al.* to encode the antimicrobial polypeptide of Wilde *et al.*

because it is obvious to combine known prior art elements according to known methods to achieve predictable results. As the sequence of the antimicrobial polypeptide was known, as were the methods required to produce a recombinant phage carrying such a peptide, one of ordinary skill in the art could easily and predictably used the phage to encode the antimicrobial polypeptide. In addition, as the composition of Hughes is to be used against *Pseudomonas*, it would clearly be desirable to use an antimicrobial agent that is active against *Pseudomonas*.

Claims 51-52, 55, 64, 91, 96-97, and newly submitted claims 105-106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes *et al.* (Bioline, pp 325-331, 2001; IDS filed 1/26/2006) in view of Nairn (Chapter 86 in Remington: The science and practice of pharmacy, Vol. II, 1995, pp 1495-1523) for the reasons set forth in the previous office action in the rejection of claims 51-52, 55, 64, 91, and 96-97.

Applicant argues: that Nairn does not cure the deficiency of Hughes.

Applicant's arguments have been fully considered and deemed non-persuasive.

As set forth above, there is no deficiency in the rejection over Hughes.

As outlined above, the instant claims are drawn to compositions for treating a bacterial biofilm wherein the biofilm is a biofilm of a patient, said composition comprising a bacteriophage that is capable of infecting a *Pseudomonas* bacterium, a polysaccharide lyase enzyme that is capable of degrading a polysaccharide within said biofilm, and a pharmaceutically acceptable antimicrobial agent.

Hughes *et al.* teach that application of phage carrying and encoding hydrolytic enzymes to destroy alginate biofilm (alginate lyase) offers huge therapeutic benefits and that delivery of phage in combination with other agents designed to reduce the severity of the symptoms of cystic fibrosis and bacterial colonization (such as antibiotics, DNAase or polypeptide defensins) could be used to effectively destroy lung biofilms (see page 329, paragraphs 2-3).

Hughes *et al.* do not teach that the formulation should be in the form of an aerosol formulation, comprising one or more of an excipient, surfactant, and/or propellant and do not specifically state that the agent is active against *Pseudomonas*.

Nairn teaches that inhalations are preparations used or designed so that a drug is carried into the respiratory tree of a patient (see paragraph bridging pages 1507 and 1508). Metered

dose inhalers are propellant-driven drug suspensions or solutions intended for delivering metered doses of the drug to the respiratory tract (see page 1508, column 1, paragraph 2).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to use a metered-dose inhaler, as disclosed by Nairn, to provide the composition of Hughes *et al.* to a patient, because the biofilm produced in a cystic fibrosis patient is in the lungs and inhalation is the simplest way to administer a drug to the lungs. In addition, as the composition of Hughes is to be used against *Pseudomonas*, it would clearly be desirable to use an antimicrobial agent that is active against *Pseudomonas*.

One would have had a reasonable expectation of success because metered-dose inhalers are a standard means for delivering drugs to the respiratory tract.

Claims 51-52, 55, 62, 91, 96-97, and newly submitted claim 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes *et al.* (Bioline, pp 325-331, 2001; IDS filed 1/26/2006) in view of Budny *et al.* (US Patent Application Publication, US 2002/0037260, 2002; IDS filed 1/26/2006) for the reasons set forth in the previous office action in the rejection of claims 51-52, 55, 62, 91, and 96-97.

Applicant argues: that Budny teaches that, for degrading biofilms of *P. aeruginosa*, alginate lyase from bacterial sources is suggested and that no phages coding and carrying hydrolytic enzymes is identified or described.

Applicant's arguments have been fully considered and deemed non-persuasive.

While Budny does not discuss bacteriophages, Hughes specifically discloses a phage carrying and encoding hydrolytic enzymes to destroy alginate biofilms. Budny discloses genes for alginate lyases and discusses basic molecular biology and biotechnology techniques for manipulating such genes. In addition, the techniques for cloning such genes into a phage were well known.

As outlined previously, the instant claims are drawn to compositions for treating a bacterial biofilm wherein the biofilm is a biofilm of a patient, said composition comprising a bacteriophage that is capable of infecting a *Pseudomonas* bacterium, a polysaccharide lyase enzyme that is capable of degrading a polysaccharide within said biofilm, and a pharmaceutically acceptable antimicrobial agent.

Hughes *et al.* teach that application of phage carrying and encoding hydrolytic enzymes to destroy alginate biofilm (alginate lyase) offers huge therapeutic benefits and that delivery of phage in combination with other agents designed to reduce the severity of the symptoms of cystic fibrosis and bacterial colonization (such as antibiotics, DNAase or polypeptide defensins) could be used to effectively destroy lung biofilms (see page 329, paragraphs 2-3).

Hughes *et al.* do not teach that the lyase encoded by the phage should be a heterologous lyase and do not specifically state that the agent is active against *Pseudomonas*.

Budny *et al.* disclose compositions for treating biofilms which comprise a mixture of an antimicrobial agent and a lyase (see paragraphs 0024-0033 and 0066). Budny *et al.* disclose that alginate lyase is an expression product of the algL gene and can be obtained from various bacterial sources and the lyase can be recombinantly produced (see paragraphs 0127 and 0129).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to use an alginate lyase from any of the listed sources in Budny *et al.* as a heterologous lyase encoded by the phage because it is obvious to combine known prior art elements according to known methods to achieve predictable results. As the sequence of the various lyase genes were known, as were the methods required to produce a recombinant phage carrying such a lyase, one of ordinary skill in the art could easily and predictably used the phage to encode one of the disclosed lyases. In addition, as the composition of Hughes is to be used against *Pseudomonas*, it would clearly be desirable to use an antimicrobial agent that is active against *Pseudomonas*.

New Claim Rejections

35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 51-52, 55, 91, and 96-97, and newly submitted claim 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes *et al.* (Bioline, pp 325-331, 2001; IDS filed 1/26/2006).

The instant claims are drawn to compositions for treating a bacterial biofilm wherein the biofilm is a biofilm of a patient, said composition comprising a bacteriophage that is capable of infecting a *Pseudomonas* bacterium, a polysaccharide lyase enzyme that is capable of degrading a polysaccharide within said biofilm, and a pharmaceutically acceptable antimicrobial agent.

Hughes *et al.* teach that application of phage carrying and encoding hydrolytic enzymes to destroy alginate biofilm (alginate lyase) offers huge therapeutic benefits and that delivery of phage in combination with other agents designed to reduce the severity of the symptoms of cystic fibrosis and bacterial colonization (such as antibiotics, DNAase or polypeptide defensins) could be used to effectively destroy lung biofilms (see page 329, paragraphs 2-3).

The disclosure of Hughes *et al.* does not specifically state that the antimicrobial agent is active against *Pseudomonas*.

It would have been obvious to one of skill in the art, at the time of invention, to use an antimicrobial agent that was active against *Pseudomonas* because, as the composition of Hughes was meant to be used against *Pseudomonas*, it would clearly be desirable to use an antimicrobial agent that is active against *Pseudomonas*.

One would have had a reasonable expectation of success because many such antimicrobial agents were known at the time of invention.

Conclusion

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Gangle whose telephone number is (571)272-1181. The examiner can normally be reached on M-F 7-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Mondesi can be reached on 571-272-0956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian J Gangle/
Examiner, Art Unit 1645

/Robert B Mondesi/
Supervisory Patent Examiner,
Art Unit 1645